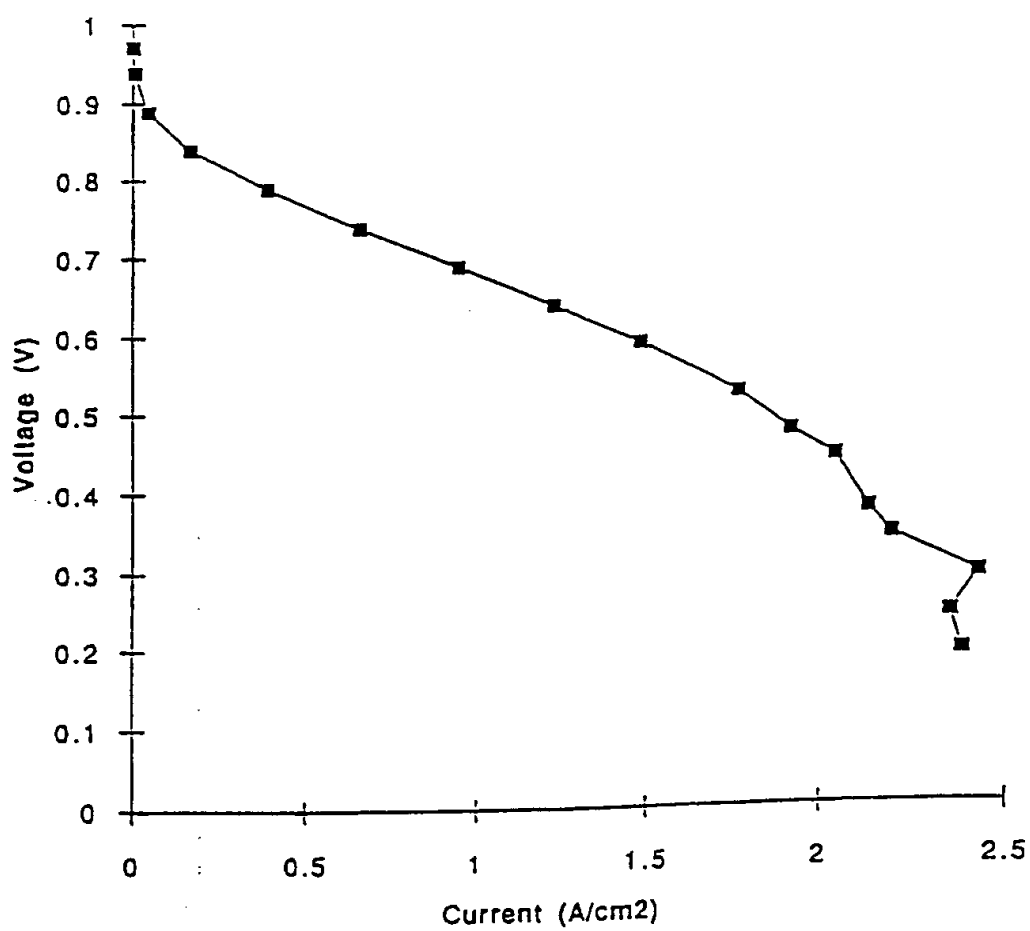


FIG. 10



10/14

FIG. 11

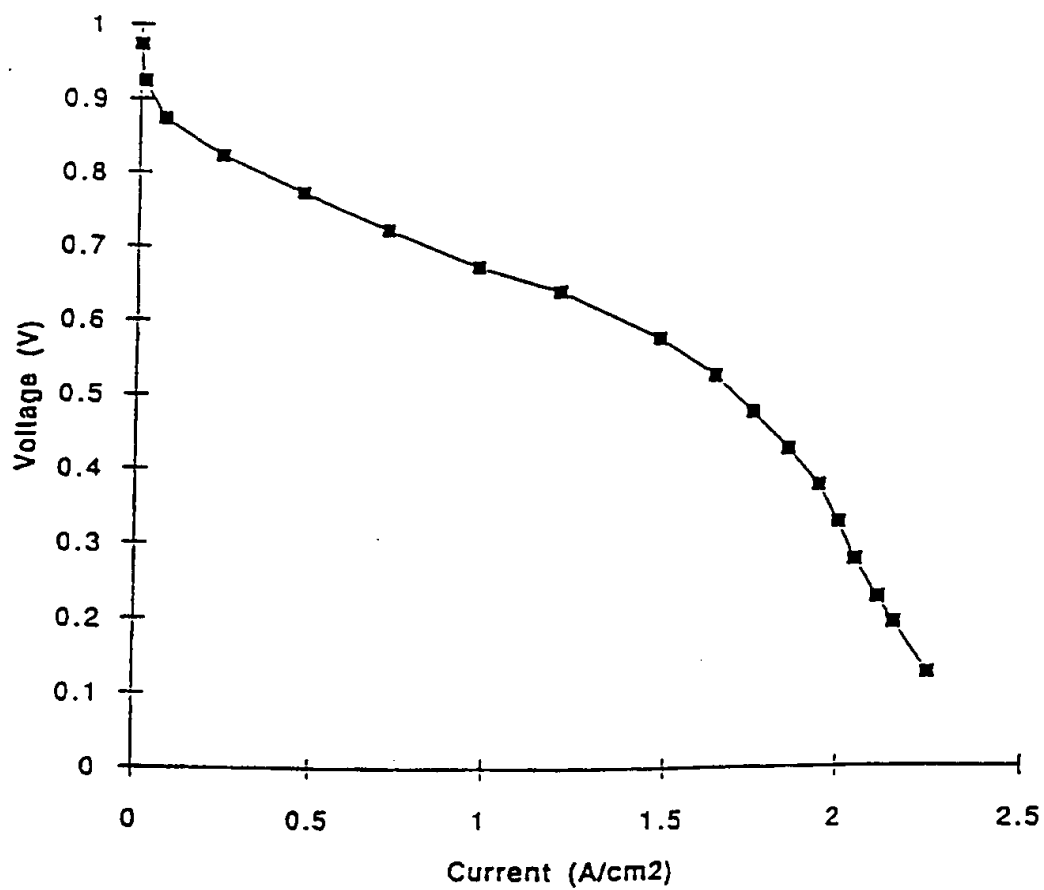


FIG. 12

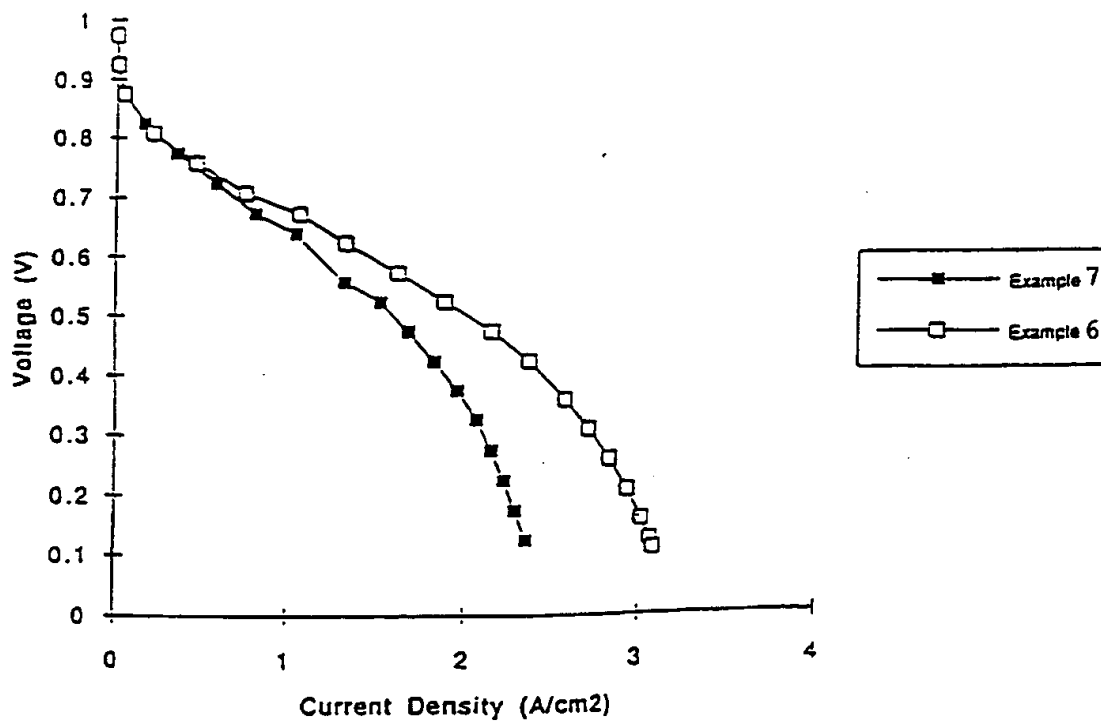


FIG. 13

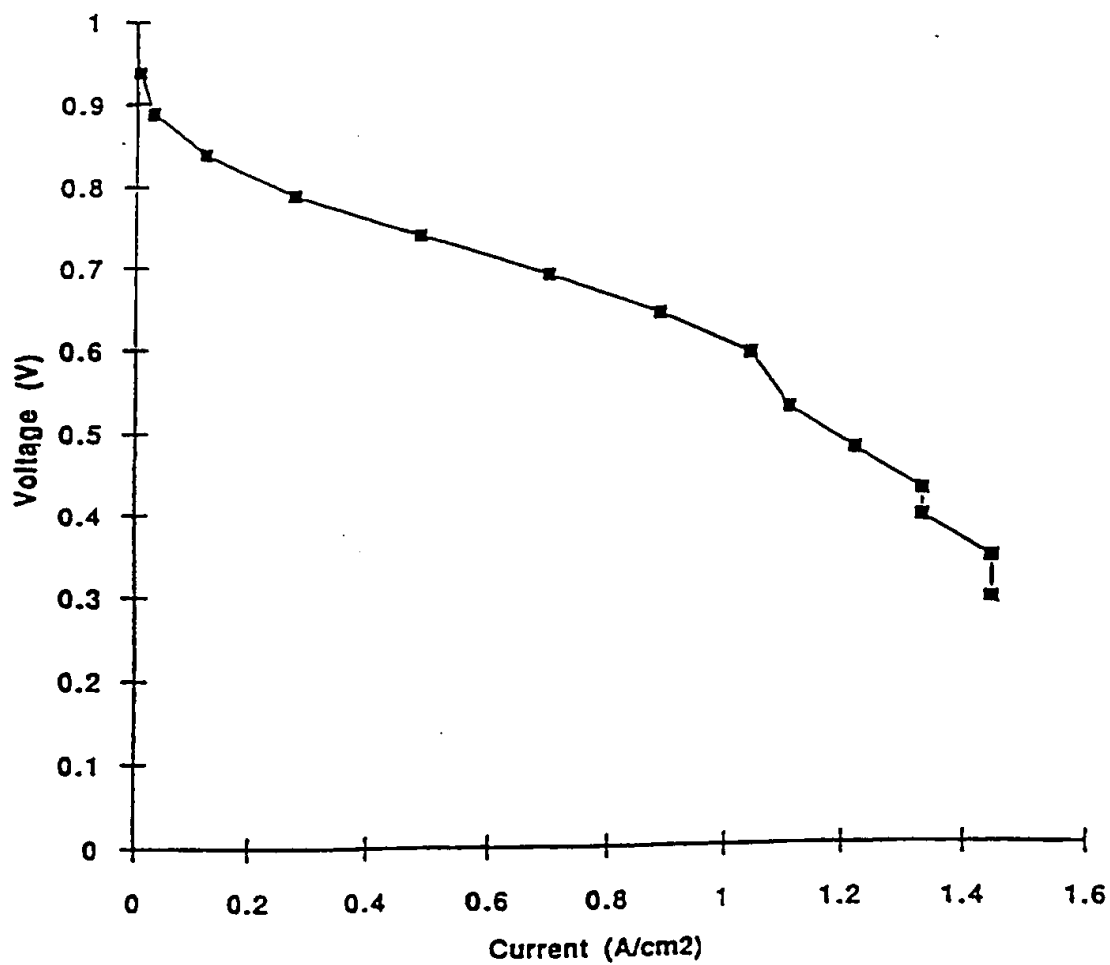
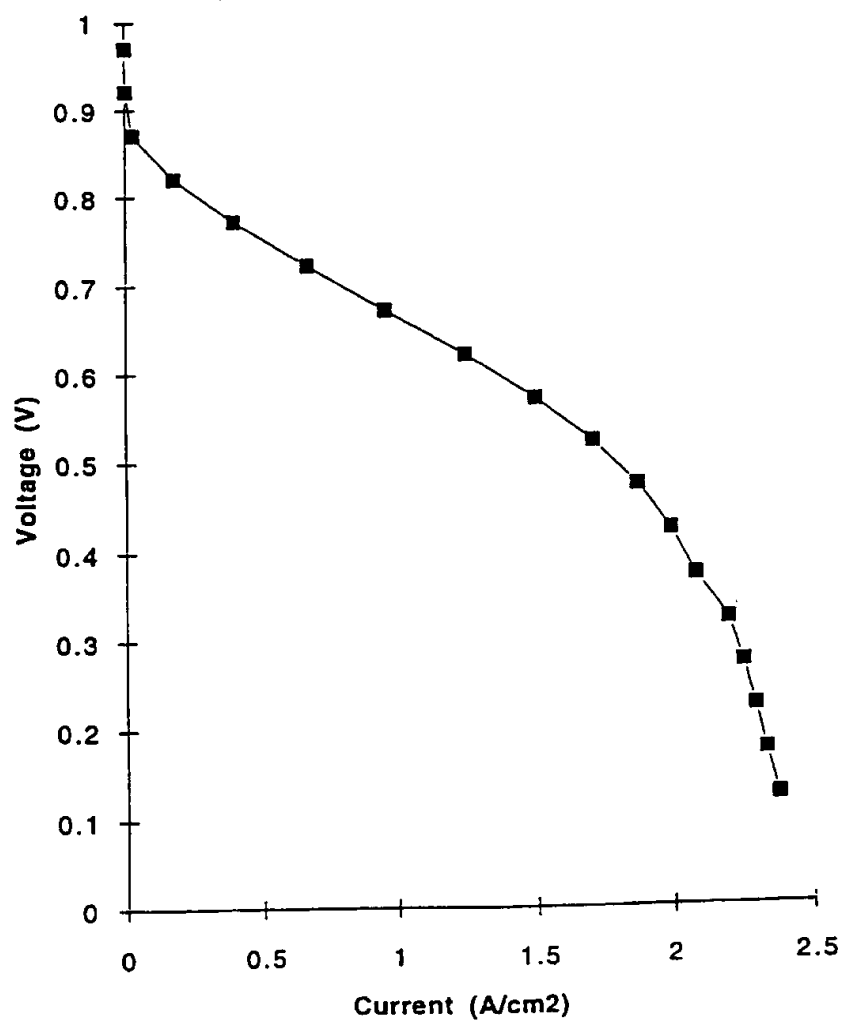


FIG. 14

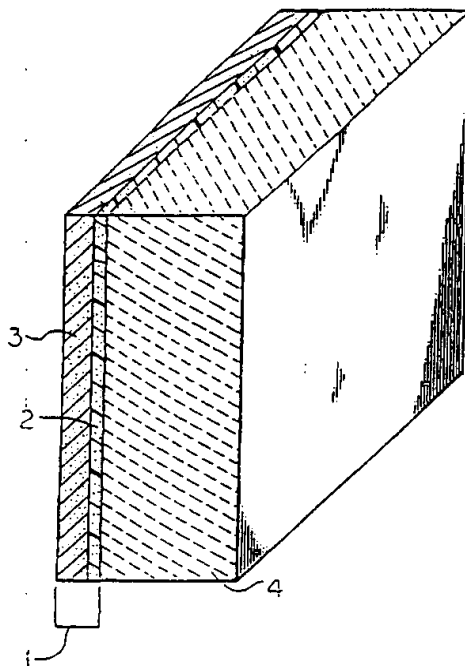




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(21) International Application Number: PCT/US96/15893 (22) International Filing Date: 4 October 1996 (04.10.96) (30) Priority Data: 08/540,105 6 October 1995 (06.10.95) US 08/554,066 6 November 1995 (06.11.95) US 60/013,050 8 March 1996 (08.03.96) US (71) Applicant: THE DOW CHEMICAL COMPANY [US/US]; 2030 Dow Center, Midland, MI 48674 (US). (72) Inventors: MUSSELL, Robert, D.; 3800 Haskin Drive, Mid- land, MI 48640 (US). BABINEC, Susan, J.; 1110 West Park, Midland, MI 48640 (US). SCORTICHINI, Carey, L.; 3609 Lawndale, Midland, MI 48642 (US). PLOWMAN, Keith, R.; 116 Cardinal, Lake Jackson, TX 77566 (US). WEBB, Steven, P.; 2014 West Sugnet Road, Midland, MI 48640 (US). REHG, Timothy, J.; Apartment 1128, 110 Lake Road, Lake Jackson, TX 77566 (US). (74) Agent: GALBRAITH, Ann, K.; The Dow Chemical Company, Patent Dept., P.O. Box 1967, Midland, MI 48641-1967 (US).	(81) Designated States: AU, CA, CN, JP, KR, MX, RU, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the</i> <i>claims and to be republished in the event of the receipt of</i> <i>amendments.</i> (88) Date of publication of the international search report: 24 December 1997 (24.12.97)	

(54) Title: FLOW FIELD STRUCTURES FOR MEMBRANE ELECTRODE ASSEMBLIES OF FUEL CELLS



(57) Abstract

An electrochemical fuel cell having a membrane electrode assembly (1) and a flow field (4) adjacent thereto wherein the flow field comprises an electrically conductive porous material having a porosity of at least 50 percent and a mean pore size of at least 35 microns. This fuel cell is able to operate at relatively high current densities and relatively high voltages at reduced gas flow rates.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 96/15893

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 H01M8/02 H01M8/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 H01M C25B

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>EP 0 629 015 A (PERMELEC SPA NORA) 14 December 1994</p> <p>see page 10, line 23 - line 25; claims 1,3,5,10; figure 6</p> <p>see page 7, line 25 - line 31</p> <p>see page 6, line 14 - line 16</p> <p style="text-align: center;">---</p> <p style="text-align: center;">-/--</p>	<p>1,6,8, 12,13, 37-39,47</p>

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

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INTERNATIONAL SEARCH REPORT

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Int. application No.

PCT/US 96/ 15893

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

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- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA210

Group I : claims 1-13 Fuel cell with electrode membrane assembly comprising a flow field structure with specific porosity. Purpose : Effective gas transport in the presence of water.

Group II : claims 14-24 Membrane electrode assembly with several catalytic layers comprising ionomer of varying equivalent weight. Purpose : Management of water content.

Group III : claims 25-35,36 Membrane electrode assembly with a catalytic layer comprising an ionomer with an equivalent weight falling in a certain range and said catalytic composition.

Group IV : Claims 37-48, 49-53 Fuel cell with membrane electrode assembly comprising conductive layers of varying porosity.

Group V : claims 54-59 Process of preparing a fuel cell having a membrane electrode assembly by applying a conductive composition intermediate the membrane and a conductive sheet.

Group VI : claims 60-63, 64-65, 66-71, 72-79 A composition comprising catalytic particles and organic compound with specific features and method in which said catalytic composition is used to prepare membrane electrode assemblies.

Purpose : Affecting the pore characteristics of the resulting active layer due to the volatilizable organic compound.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 96/15893

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